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Moose Population Estimate for the Saskeram Wildlife Management Area in January 1987.

Cross, Dale. 1987

Manitoba
Natural Resources
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MOOSE POPULATION ESTIMATE FOR THE SASKERAM WILDLIFE MANAGEMENT AREA IN JANUARY 1987

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June 1987

Manitoba
Natural Resources
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Moose Population Estimates for Saskeram Wildlife Management Area

Department of Natural Resources
Wildlife Branch

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ABSTRACT

A strip-transect aerial survey was conducted 12, 15 and 16 January, 1987 to estimate the size of the moose population in the Saskeram Wildlife Management Area. Twenty-four percent of the moose habitat was surveyed, resulting in a population estimate of 263 moose with a 95% confidence interval of ± 31%. These results indicate a continuing population decline that has been occurring since the mid 1970's. Approximately 30 cm of snow cover, combined with above normal temperatures, provided excellent viewing conditions during the survey.

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INTRODUCTION

The 959 sq km Saskeram Wildlife Management Area (W.M.A.) is within the boundaries of Game Hunting Area 6, located in central Manitoba northwest of The Pas (Figure 1).

The Saskeram W.M.A. is characterized by poorly drained organic soils with shallow lakes and swamps. Grasses, sedges and willow are located on the better drained sites. Mature stands of deciduous growth with an understory of willow, alder and dogwood occur on river levees and most stream levees. Bogs are dominated by willow and bog birch with an understory of grasses and sedges. Softwood and hardwood stands occur throughout the thin till-covered limestone outcrop found in the northwest portion of the W.M.A. In the northern portion of the conifer-covered region (Bignell Lake area), about 1,500 acres of mature softwoods were logged in the mid 1970's. Both hardwood and softwood regeneration has occurred on this site and in the 25 year old, 4,000 acre burn located south of this site.

The area is capable of supporting approximately 600 moose (**Alces alces**) under ideal conditions (1981, Personal Communication, R. Robertson). Population estimates in the early 1960's were around 500 animals (Province of Manitoba Wildlife Branch unpublished survey data).

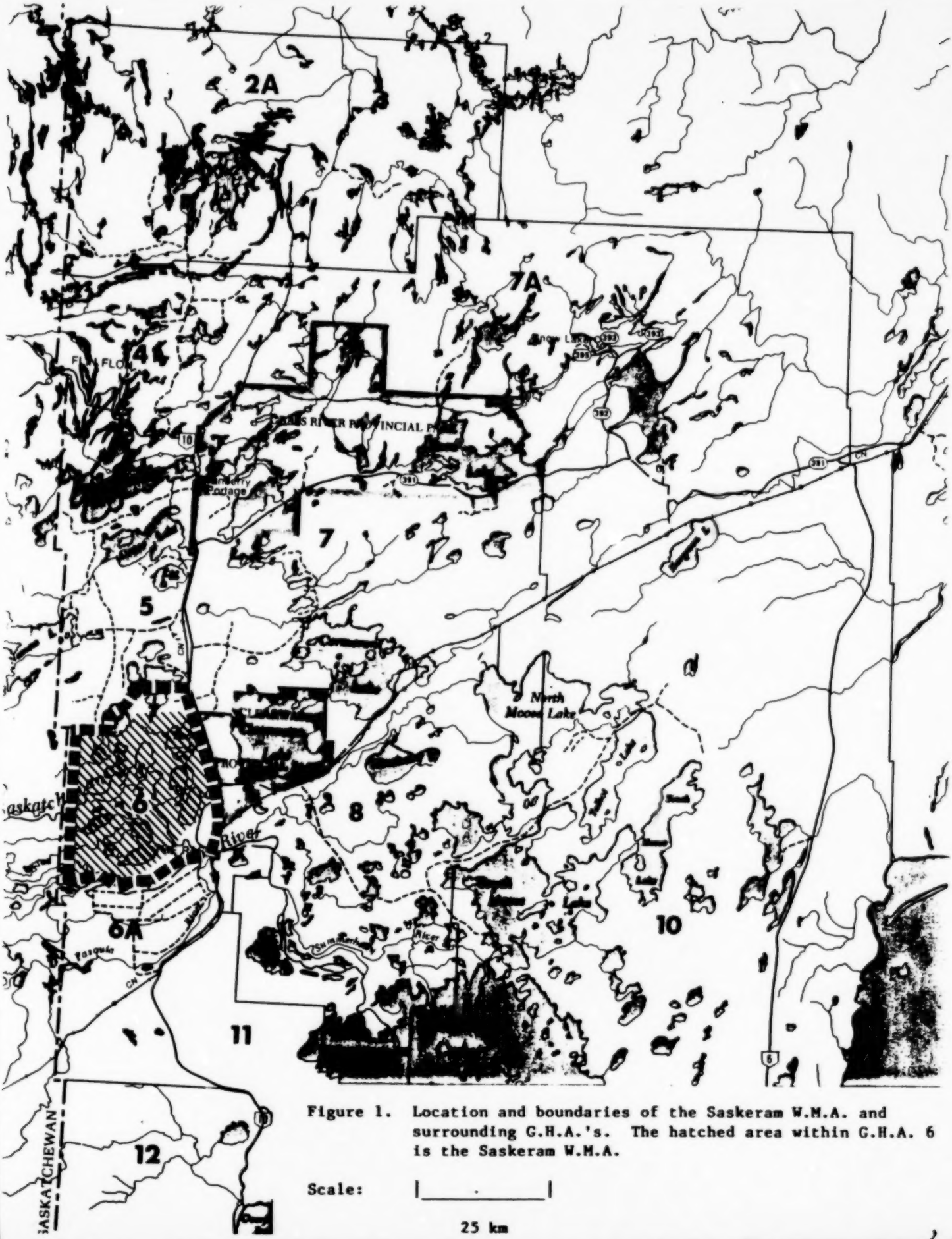

Figure 1. Location and boundaries of the Saskeram W.M.A. and surrounding G.H.A.'s. The hatched area within G.H.A. 6 is the Saskeram W.M.A.

Scale: |_____|

25 km

Native and sport hunters harvest about 50 moose annually (Province of Manitoba Wildlife Branch unpublished harvest data). Native harvest is predominantly cows and calves while the sport hunter is restricted to bulls. Native harvest estimates may be conservative because of the difficulty of accurately recording native kills.

Earlier Saskeram W.M.A. moose population surveys conducted in 1976, 1977, and 1981 (Cross et al. 1983) indicated a decreasing population and recommended that population surveys continue to better determine allowable harvest and forecast population trends.

The objective of the 1986 survey was to determine the current population in Saskeram W.M.A.

METHODS

A strip-transect survey as described by Eberhardt (1978) was flown for a total of 9.3 hours on 12, 15, 16 January, 1987, using a fixed wing wheel-ski equipped Cessna 185. All flying was done under the following conditions:

(a) visibility greater than 15 km

(b) a rest break after every 2 hours of survey time

(c) wind less than 30 km/h

(d) survey conducted between 1000 hrs and 1530 hrs

(e) flight lines oriented north-south

(f) observations from the right side of the aircraft

(g) survey altitude of 180 m above ground

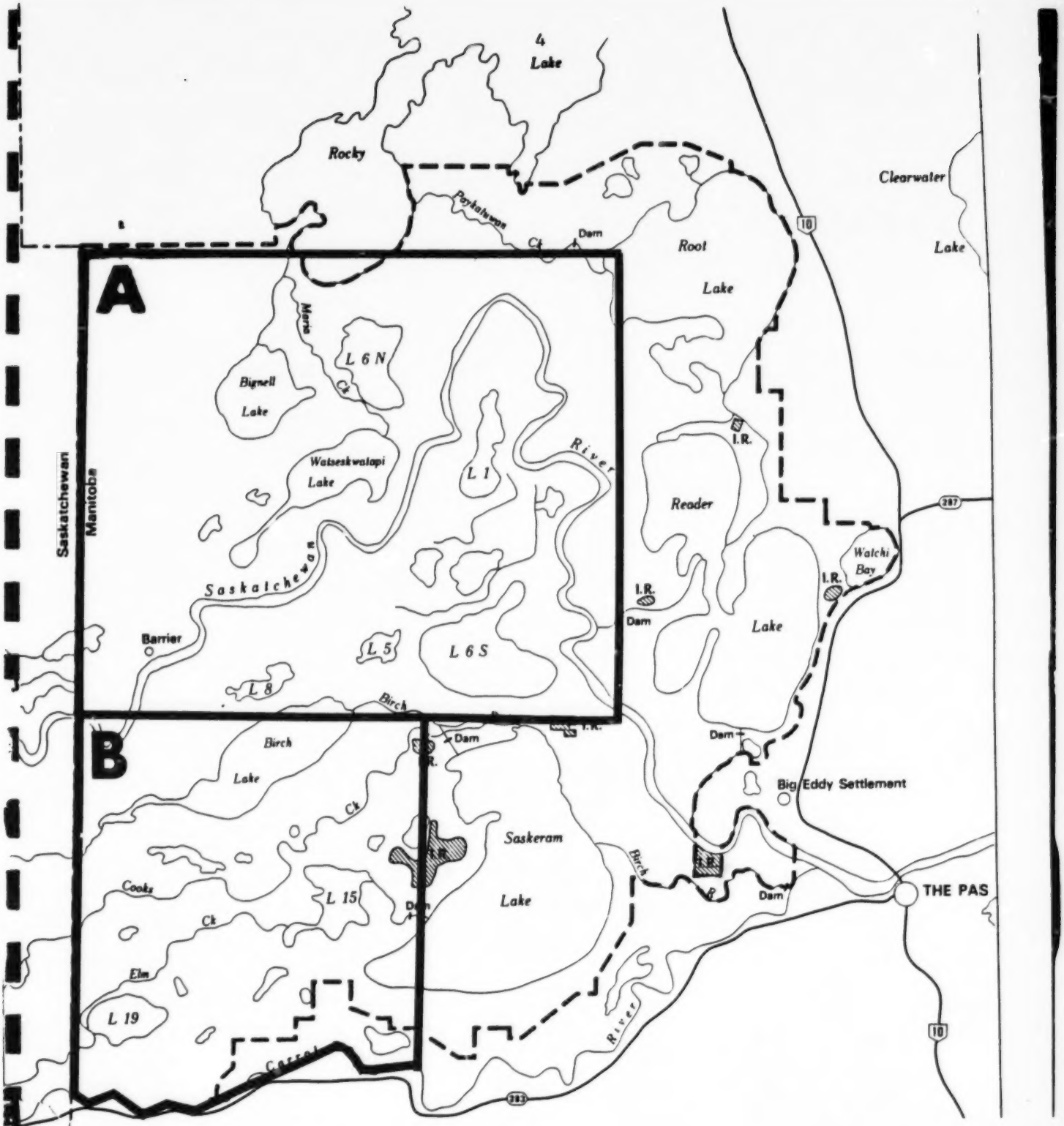

Figure 2. Saskeram W.M.A. survey blocks A & B

Scale: |_____|

5 km

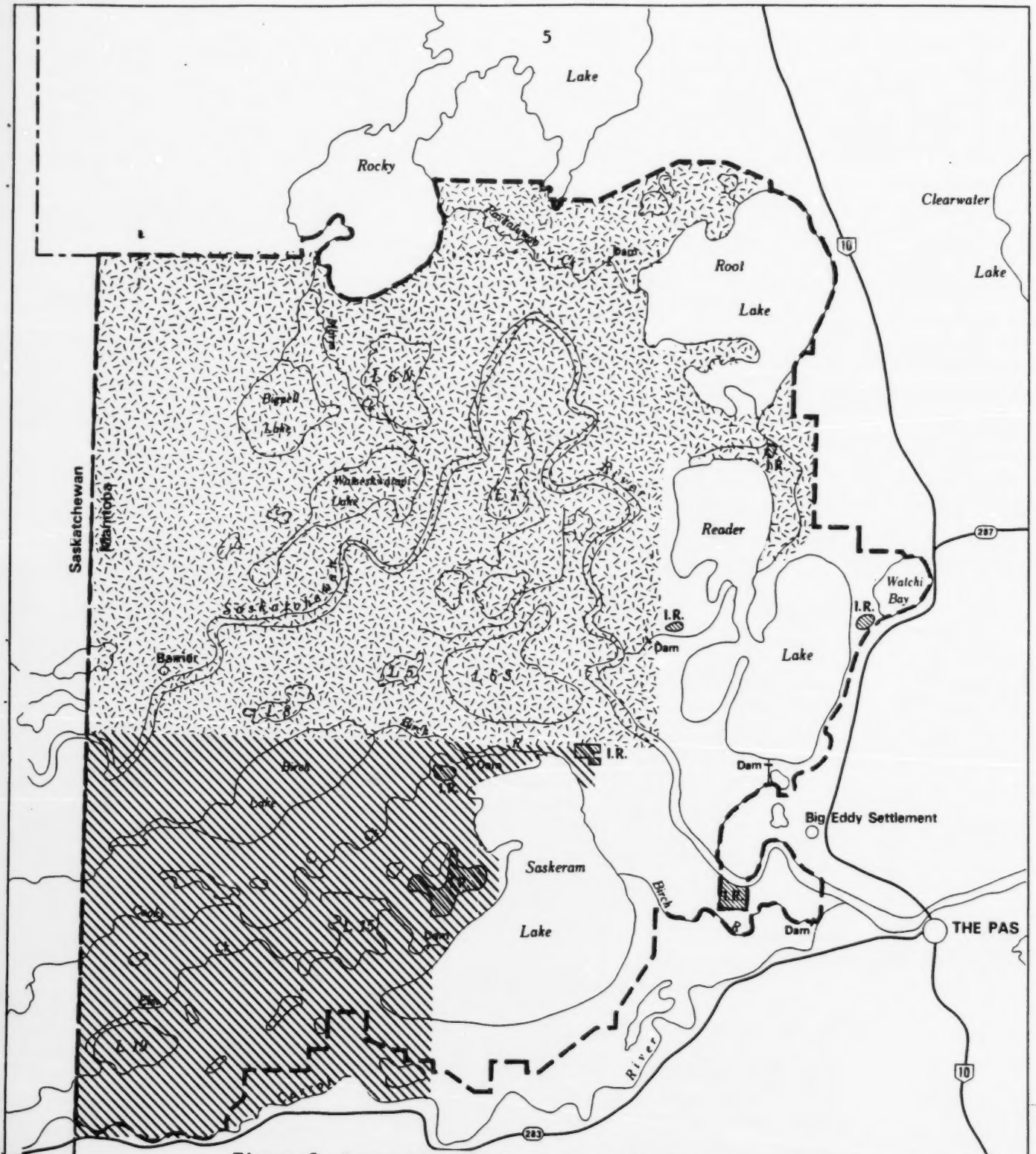

Figure 3. Areas included in each of the 2 strata used in the stratified design. The flecked area is Stratum 1. The hatched area is Stratum 2. The broken line is the W.M.A. boundary.

Scale: |_____|

5 km

A 4 way intercom communication system was used to allow the pilot, recorder and the 2 observers to communicate. Because of this system, the sightings of the observers were not completely independent. The higher number of moose sighted by either the front or rear observer were recorded (cf. Magnusson et al. 1978). The boundaries of the strip to be watched by each observer were indicated on the aircraft windows and wing strut. Adjustments were made by flying over a known width strip to determine empirically the exact position of the markers, as recommended by Caughley (1977).

The survey was flown in the same rectangular areas (A and B., Figure 2) which were flown in previous surveys (Cross et al. 1983). Each of these areas represented sampling areas for 2 strata in a modified stratified random sampling design. The boundaries of the 2 strata per se are shown in Figure 3.

Total number of quadrats and sampling effort for the 2 strata are recorded in Table 1. Although the survey was flown in strips, the data were treated as if collected in quadrats (Eberhardt, 1978). The area of the quadrat was the length of the strip (either 19.2 km or 15.3 km) multiplied by the width (0.203 km).

Table 1. Characteristics and size of the strata used in the stratified sampling design.

Stratum Number	Sample Block	Quadrat Size (Sq Km)	Total Quadrats	Sample Quadrats
1	A	3.9	133	28
2	B	3.1	91	24

Data were analyzed in a stratified random sampling program on a Compaq 286 personal computer. Calculations followed Snedecor and Cochrane (1967) and Siniff and Skoog (1964).

RESULTS

The 1987 moose population estimate was 263 with a 95% confidence interval of 182 to 344 (± 30%) (Table 2). Sampling intensities within stratum 1 and 2 were 21% and 31%, respectively.

Table 2. Mean number of moose per quadrat, and estimated 1987 Saskeram W.M.A. population.

Stratum	Total Quadrats	Sample Quadrats	Quadrat Size(Sq Km)	Mean Per Quadrat	Variance
1	133	28	3.9	1.48	1.48
2	91	24	3.1	0.75	1.45

Overall mean per quadrat:	1.174
Standard error:	0.180
Estimated total population:	(95% C.I.) 263 ± 81 (30.8%)
Increase in precision due to stratification:	2%

The trend toward a decrease in the size of the population appears to be continuing when compared to the results of the previous four population surveys (Figure 4).

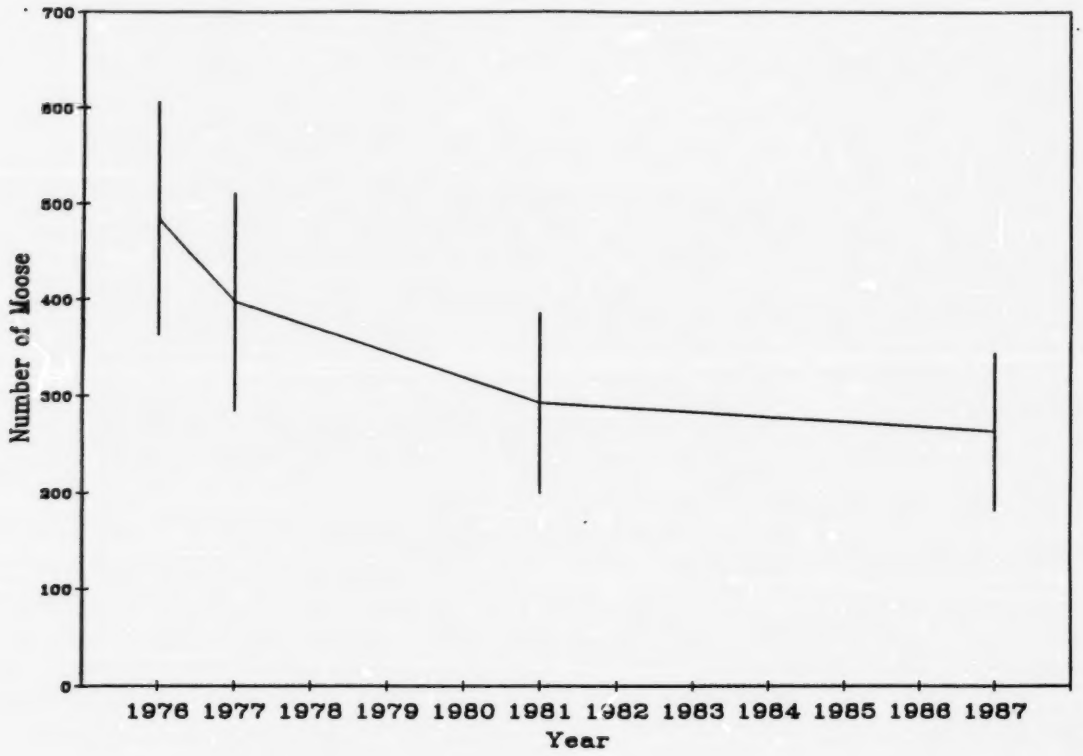

Figure 4. Saskeram W.M.A. population trend based on survey results for 1976, 1977, 1981, 1987

Approximately 30 cm of snow cover existed throughout the survey area, and above normal temperatures from -4^{o} to -20^{o} celcius, combined with calm winds, resulted in excellent viewing conditions. The survey was interrupted on January 12 because of incoming fog, but continued on January 15.

DISCUSSION

The results of this and previous surveys indicate a population decline between 1976 and 1981, with a 10% reduction since 1981.

Despite favourable reproduction and calf survival, the Saskeram W.M.A. moose population has failed to recover (6 year mean of 57 calves per 100 cows, 27% calf segment).

It appears that the recent native and licenced hunter harvest of approximately 50 moose annually in the Saskeram W.M.A. will most likely continue to contribute to a population decline. Since native harvest figures are difficult to obtain, Department of Natural Resources native harvest estimates for the Saskeram W.M.A. may be conservative.

Based on personal observations, Manitoba moose move both to and from Saskatchewan across the Saskatchewan-Manitoba boundary. The positive benefits to the Saskeram W.M.A. population is impossible to determine, although it appears that Manitoba would experience a net gain because of the higher moose density of .46 moose per sq km on the Saskatchewan side of the boundary (Saskatchewan Wildlife Branch 1987 Big Game Status Report, Dept. of Parks, Recreation & Culture. Unpublished data) compared to this survey's findings of .31 moose per sq km.

Alternative management efforts are required for the Saskeram W.M.A. if the trend of a 10 year population decline is to be reversed. Increased discussions with native people and a review of potential habitat improvement programs should be considered.

A population survey should be flown again in 1989/90 to further monitor this population to help determine management options.

ACKNOWLEDGEMENTS

I wish to acknowledge the assistance of Gene Collins for reviewing the manuscript and acting as second observer. A special thanks to Reg Fast who piloted the aircraft used on the survey and who also recorded observations; to Brad Johnson for writing the stratified random sampling program; and to Brian Knudsen for editing the manuscript.

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